WHAT IS CLAIMED IS:

1. A diode-laser having a longitudinal axis, comprising:

a substrate having two facets, the distance between said facets defining the length of the diode laser;

a lower cladding region, a lower waveguide region, an active region including a quantum-well layer, an upper waveguide region, and an upper cladding region, formed on said substrate;

an elongated electrode electrically coupled to said upper cladding region and located between said facets and defining an elongated pumped section of the diode laser, said electrode having a length less than the length of the diode-laser thereby leaving at least one unpumped section adjacent said diode-laser at a first end of said electrode, the longitudinal axis of the diode-laser extending through said pumped and unpumped sections of the diode-laser, said quantum-well layer having a higher bandgap in said unpumped section than in said pumped section; and

at least one etched area in said upper cladding region of said unpumped section of diode-laser, said etched area aligned on the longitudinal axis of the diode-laser and having a maximum depth less than or equal to the total thickness of said upper cladding region.

2. The diode-laser of claim 1, wherein said etched area has a biconcave shape and a uniform depth.

3. The laser of claim 1, wherein said etched area has a rectangular shape and the depth of said etched area varies in a direction perpendicular to the longitudinal axis of the diode-laser with said maximum depth being on said longitudinal axis.

4. The diode-laser of claim 1, wherein said electrode is positioned between said facets providing an unpumped section of said diode-laser at each end of said electrode.

5. The diode-laser of claim 4, wherein there is at least one said etched area in said cladding region in each of said unpumped sections.

6. The diode-laser of claim 5, wherein said upper cladding layer in each of said unpumped sections includes the same number of said etched areas.

7. The diode-laser of claim 5, wherein said upper cladding layer in one of said unpumped sections includes a different number of said etched areas than is included in said upper cladding layer in the other of said unpumped sections.

8. The diode-laser of claim 5, wherein said unpumped sections of said diode-laser are at each end thereof.

9. The diode-laser of claim 1, wherein said electrode is located with one end thereof adjacent a said facet.

10. The diode-laser of claim 9, wherein there is only one said unpumped section located between an opposite end of said electrode and an opposite said facet.

11. The laser of claim 1, wherein said active region, and each of said waveguide, and cladding regions includes at least one layer of a semiconductor material.

12. The laser of claim 1, wherein said electrode has a width greater than about 30 micrometers.

13. The laser of claim 1, wherein said electrode has a length between about 0.5 millimeters and 1.5 millimeters.

14. A diode-laser having a longitudinal axis, comprising:

a substrate;

a lower cladding region a lower waveguide region, an active region including a quantum-well layer, an upper waveguide region, and an upper cladding region, grown in listed order on said substrate, said substrate and said regions thereon having two, parallel facets, the distance between said facets defining the length of the diode laser;

an elongated electrode electrically coupled to said upper cladding region and arranged perpendicular to said facets and defining an elongated pumped section of the diode laser, said electrode having a length less than the length of the diode-laser and being situated between said facets in a position such there is an unpumped section adjacent each end of said electrode, the longitudinal axis of the diode-laser extending through said pumped and unpumped sections of the diode-laser, and said quantum-well layer having a higher bandgap in said unpumped sections than in said pumped section; and

at least one etched area in said upper cladding region of each of said unpumped sections of diode-laser said etched area aligned on the longitudinal axis of the diode-laser and having a maximum depth less than or equal to the total thickness of said upper cladding region.

15. The diode-laser of claim 14, wherein each of said unpumped sections is located between an end of said electrode and a said facet.

16. The diode-laser of claim 15, wherein said upper cladding layer in each of said unpumped sections includes the same number of said etched areas.

17. A diode-laser having a longitudinal axis, comprising:

a substrate having two, parallel facets, the distance between said facets defining the length of the diode laser;

a lower cladding region a lower waveguide region, an active region including a quantum-well layer, an upper waveguide region, and an upper cladding region, grown in listed order on said substrate;

an elongated electrode electrically coupled to said upper cladding region arranged perpendicular to said facets and defining an elongated pumped section of the diode laser, said electrode having a length less than the length of the diode-laser thereby leaving at least one unpumped section of said diode-laser at a first end of said electrode, the longitudinal axis of the diode-laser extending through said pumped and unpumped sections of the diode-laser, said quantum-well layer having a higher bandgap in said unpumped section than in said pumped section;

at least one etched area in said upper cladding region of said unpumped section of diode-laser said etched area aligned on the longitudinal axis of the diode-laser and having a maximum depth less than or equal to the total thickness of said upper cladding region; and

wherein, for a selected current passed through the diode laser via said electrode, the number of said unpumped areas, and the number, shape and depth profiles of said etched areas in said cladding layers in said unpumped areas is selected such that the diode-laser operates in only a single transverse mode.

18. A diode-laser having a longitudinal axis, comprising:

a substrate;

a lower cladding region a lower waveguide region, an active region including a quantum-well layer, an upper waveguide region, and an upper cladding region, grown in listed order on said substrate, said substrate and said regions grown thereon having two, parallel facets, the distance between said facets defining the length of the diode laser;

an elongated electrode having a length less than the length of the diode-laser on said upper cladding region, arranged perpendicular to said facets and defining a pumped stripe of said diode-laser, the longitudinal axis of the diode-laser extending through said pumped stripe of the diode-laser; and

at least one etched area in said upper cladding region of the diode-laser outside said strip section and aligned with said longitudinal axis, said at least one etched area having a maximum depth less than or equal to the thickness of said upper cladding region and having a shape and depth profile selected to provide diverging lens effect for laser radiation circulating in said waveguide-regions.

19. The diode-laser of claim 18, wherein said etched area has a uniform depth.

20. The laser of claim 19, wherein said etched area has a rectangular shape and the depth of said etched area varies in a direction perpendicular to said longitudinal axis of the diode-laser, with said maximum depth being on said longitudinal axis.

21. A diode-laser comprising:

a multi-layer structure including at least one cladding layer; and

an electrode electrically coupled to said cladding layer with at least one end of said electrode being spaced from an end face of the diode laser to define an unpumped section thereof, and wherein said cladding layer includes a recessed area aligned with said unpumped area and having a configuration which modifies the effective refractive index of the unpumped area in order to improve the mode performance of the laser.

22. A diode-laser as recited in claim 21, wherein said recessed area is formed in an outer cladding layer.

23. A diode-laser as recited in claim 22, wherein said structure includes a quantum well layer wherein the portion of the quantum well layer aligned with the electrode is formed with a single crystalline structure and the portion of the quantum well layer in the unpumped region is a disordered structure.

24. A diode-laser as recited in claim 21, wherein said recessed area is configured to create an effective diverging lens for laser radiation circulating in the diode-laser.